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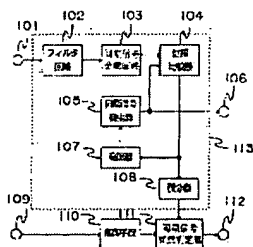
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(54) PRESENCE OF ABSENCE DECIDING METHOD FOR IMAGE
SYNCHRONIZATION SIGNAL AND SYNCHRONIZATION SIGNAL DETECTION
SYSTEM



(57)Abstract:

PROBLEM TO BE SOLVED: To improve validity and stability for decision of presence or absence of a synchronization signal.

SOLUTION: A synchronization signal detection means 113 detects synchronization signals, included in the image signals and outputs a physical value deciding signal in response to the number of synchronizing signals which are detected in a fixed time. A decision means 112 compares a physical value deciding signal, outputted from the means 113 with the decision reference to decide the presence or absence of synchronization signals. A blind sector, having a variable width, is set for the decision reference of the means 112. Then a control means 110 changes the width of the blind sector to zero or the small value for a fixed time, when a signal to which the input of the image signals is switched is inputted. Thus, the stable decision is assured of a normal state by the decision reference having a blind sector. Then the width of the blind sector is reduced in a switching mode of the image signals. As a result, valid decision is assured, even when a non-signal channel is switched to a channel of a weak electric field.

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CLAIMS

[Claim(s)]

[Claim 1] The existence judging approach of the image synchronizing signal which carries out the fixed time change of the width of face of said neutral zone to zero thru/or small width of face when the existence of said synchronizing signal is judged by the criterion which has a neutral zone based on the signal for a judgment which detects the synchronizing signal contained in a picture signal, and is acquired and the input of said picture signal is switched.

[Claim 2] The existence judging approach of the image synchronizing signal characterized by said signal for a judgment being the physical quantity according to the number of said synchronizing signals detected in fixed time amount in the existence judging approach of an image synchronizing signal according to claim 1.

[Claim 3] The existence judging approach of an image synchronizing signal that it

is the pulse signal in which said signal for a judgment is generated when said synchronizing signal is detected, and said criterion is characterized by being set up corresponding to the enumerated data acquired by carrying out said pulse signal the number of fixed hour meters in the existence judging approach of an image synchronizing signal according to claim 1.

[Claim 4] It is based on the signal for a judgment which detects the synchronizing signal contained in a picture signal, and is acquired. The existence of said synchronizing signal is judged by the 1st criterion which has one threshold. When the existence of said synchronizing signal is judged by the 2nd criterion which carries out the number of fixed hour meters of the number of the same judgment results concerning this judgment, and has one threshold and the input of said picture signal is switched, The existence judging approach of the image synchronizing signal which carries out the fixed time change of the threshold of said 2nd criterion to zero thru/or a small value.

[Claim 5] It is based on the signal for a judgment which detects the synchronizing signal contained in a picture signal, and is acquired. The existence of said synchronizing signal is judged by the 1st criterion which has one threshold. The existence judging approach of the image synchronizing signal which carries out the fixed time change of the width of face of said neutral zone to zero thru/or small width of face when the existence of said synchronizing signal is judged by the 2nd criterion which carries out the number of fixed hour meters of the number of the same judgment results concerning this judgment, and has a neutral zone and the input of said picture signal is switched.

[Claim 6] The existence judging approach of the image synchronizing signal characterized by said signal for a judgment being the physical quantity according to the number of said synchronizing signals detected in fixed time amount in the existence judging approach of an image synchronizing signal according to claim 4 or 5.

[Claim 7] A synchronizing signal detection means to output the signal for a judgment of the physical quantity according to the number of the synchronizing

signals which detected the synchronizing signal contained in a picture signal, and were detected in fixed time amount, In the synchronizing signal detection system which comes to have a judgment means to judge the existence of said synchronizing signal for said signal for a judgment as compared with a criterion The criterion of said judgment means is a synchronizing signal detection system characterized by establishing the control means changed into fixed time amount zero thru/or small width of face when the signal with which it came to set up the neutral zone of adjustable width of face, and the input of said picture signal was switched in the width of face of this neutral zone is inputted.

[Claim 8] In a synchronizing signal detection system according to claim 7 said synchronizing signal detection means The oscillator which generates the signal of the frequency according to the control voltage given, and the synchronizing signal generator which generates the synchronizing signal of the frequency according to the frequency of the signal outputted from this oscillator, The phase comparator which compares the phase of the synchronizing signal outputted from this synchronizing signal generator, and the synchronizing signal contained in a picture signal, and controls the control voltage of said oscillator according to those phase contrast, The synchronizing signal detection system characterized by coming to have an integral means to integrate with said control voltage and to output said signal for a judgment.

[Claim 9] It is the synchronizing signal detection system characterized by being what outputs a pulse signal as said signal for a judgment whenever it sets to a synchronizing signal detection system according to claim 7, said synchronizing signal detection means detects whether the synchronizing signal contained in said picture signal according to the predetermined period of said synchronizing signal was inputted and said synchronizing signal is detected.

[Claim 10] A synchronizing signal detection means to output the signal for a judgment of the physical quantity according to the number of the synchronizing signals which detected the synchronizing signal contained in a picture signal, and were detected in fixed time amount, In the synchronizing signal detection system

which comes to have a judgment means to incorporate said signal for a judgment and to judge the existence of said synchronizing signal as compared with a criterion said judgment means By the 2nd criterion which judges said signal for a judgment outputted from said synchronizing signal detection means by the 1st criterion which has one threshold, carries out the number of fixed hour meters of the number of the same judgment results concerning this judgment, and has one threshold The synchronizing signal detection system characterized by coming to prepare the control means which carries out the fixed time change of the threshold of said 2nd criterion to zero thru/or a small value when the existence of said synchronizing signal is judged and the input of said picture signal is switched.

[Claim 11] A synchronizing signal detection means to output the signal for a judgment of the physical quantity according to the number of the synchronizing signals which detected the synchronizing signal contained in a picture signal, and were detected in fixed time amount, In the synchronizing signal detection system which comes to have a judgment means to incorporate said signal for a judgment and to judge the existence of said synchronizing signal as compared with a criterion said judgment means By the 2nd criterion which judges said signal for a judgment outputted from said synchronizing signal detection means by the 1st criterion which has one threshold, carries out the number of fixed hour meters of the number of the same judgment results concerning this judgment, and has a neutral zone The synchronizing signal detection system characterized by coming to prepare the control means which carries out the fixed time change of the width of face of said neutral zone to zero thru/or small width of face when the existence of said synchronizing signal is judged and the input of said picture signal is switched.

[Claim 12] In a synchronizing signal detection system according to claim 10 or 11 said synchronizing signal detection means The oscillator which generates the signal of the frequency according to the control voltage given, and the synchronizing signal generator which generates the synchronizing signal of the

frequency according to the frequency of the signal outputted from this oscillator, The phase comparator which compares the phase of the synchronizing signal outputted from this synchronizing signal generator, and the synchronizing signal contained in a picture signal, and controls the control voltage of said oscillator according to those phase contrast, The synchronizing signal detection system characterized by coming to have an integral means to integrate with said control voltage and to output said signal for a judgment.

[Claim 13] The existence judging approach of the image synchronizing signal compulsorily judged during 1 scheduled time to be those [said] with a synchronizing signal when the existence of said synchronizing signal is judged by the criterion which has a neutral zone based on the signal for a judgment which detects the synchronizing signal contained in a picture signal, and is acquired and the input of said picture signal is switched.

[Claim 14] It has a signal means for switching, a synchronizing signal detection means, a synchronizing signal existence judging means, and a control means. Said synchronizing signal detection means The oscillator which generates the signal of the frequency according to the control voltage given, and the synchronizing signal generator which generates the synchronizing signal of the frequency according to the frequency of the signal outputted from this oscillator, The phase comparator which compares the phase of the synchronizing signal outputted from this synchronizing signal generator, and the synchronizing signal contained in a picture signal, and controls the control voltage of said oscillator according to those phase contrast, It has an integral means to integrate with said control voltage and to output the signal for a judgment, and a means to intercept the control voltage inputted into said oscillator. It is what outputs the synchronizing signal outputted from said synchronizing signal generator to each part of a television receiver. Said signal means for switching It is what is switched and outputted according to the command which can give the synchronizing signal inputted and the synchronizing signal outputted from said synchronizing signal detection means with a picture signal. Said judgment means The existence of

said synchronizing signal is judged as compared with the criterion which has a fixed neutral zone for said signal for a judgment outputted from said synchronizing signal detection means. Said control means The synchronizing signal detection system characterized by being what outputs the change-over command to which the synchronizing signal outputted to said means for switching from said synchronizing signal detection means is made to output while outputting the disconnect command of said control voltage to said synchronizing signal detection means, when the input of a picture signal is switched.

[Claim 15] The signal change-over circuit which switches the tuner which changes the RF signal inputted into a television signal, and the video signal inputted and the television signal outputted from said tuner, and outputs one picture signal, The Y/C separation circuit, color demodulator circuit, and RGB code processing circuit which process the picture signal outputted from this signal change-over circuit, The deviation control circuit which controls CRT according to the picture signal outputted from this RGB code processing circuit, and displays an image on the CRT concerned, The synchronizing signal detector which outputs the signal for a judgment of the physical quantity according to the number of the synchronizing signals which detected the synchronizing signal contained in the picture signal outputted from said signal change-over circuit, and were detected in fixed time amount, In the television receiver which is equipped with the judgment circuit which judges the existence of said synchronizing signal for said signal for a judgment as compared with a criterion, and performs image display control based on the existence judging of said synchronizing signal When the input change-over signal of the picture signal with which it comes to set up the neutral zone of adjustable width of face, and the criterion of said judgment circuit includes the channel selection command of said television signal and the selection command of said video signal is inputted, The television receiver characterized by establishing the control means which changes the width of face of said neutral zone into fixed time amount zero thru/or small width of face.

[Claim 16] The signal change-over circuit which switches the tuner which

changes the RF signal inputted into a television signal, and the video signal inputted and the television signal outputted from said tuner, and outputs one picture signal, The Y/C separation circuit, color demodulator circuit, and RGB code processing circuit which process the picture signal outputted from this signal change-over circuit, The deviation control circuit which controls CRT according to the picture signal outputted from this RGB code processing circuit, and displays an image on the CRT concerned, The synchronizing signal detector which outputs the signal for a judgment of the physical quantity according to the number of the synchronizing signals which detected the synchronizing signal contained in the picture signal outputted from said signal change-over circuit, and were detected in fixed time amount, In the television receiver which is equipped with the judgment circuit which judges the existence of said synchronizing signal for said signal for a judgment as compared with a criterion, and performs image display control based on the existence judging of said synchronizing signal Said judgment circuit judges said signal for a judgment outputted from said synchronizing signal detector by the 1st criterion which has one threshold. By the 2nd criterion which carries out the number of fixed hour meters of the number of the same judgment results concerning this judgment, and has one threshold When the input change-over signal of the picture signal which judges the existence of said synchronizing signal and includes the channel selection command of said television signal and the selection command of said video signal is inputted, The television receiver characterized by coming to prepare the control circuit which carries out the fixed time change of the threshold of said 2nd criterion to zero thru/or a small value.

[Claim 17] The signal change-over circuit which switches the tuner which changes the RF signal inputted into a television signal, and the video signal inputted and the television signal outputted from said tuner, and outputs one picture signal, The Y/C separation circuit, color demodulator circuit, and RGB code processing circuit which process the picture signal outputted from this signal change-over circuit, The deviation control circuit which controls CRT

according to the picture signal outputted from this RGB code processing circuit, and displays an image on the CRT concerned, The synchronizing signal detector which outputs the signal for a judgment of the physical quantity according to the number of the synchronizing signals which detected the synchronizing signal contained in the picture signal outputted from said signal change-over circuit, and were detected in fixed time amount, In the television receiver which is equipped with the judgment circuit which judges the existence of said synchronizing signal for said signal for a judgment as compared with a criterion, and performs image display control based on the existence judging of said synchronizing signal Said judgment circuit by the 2nd criterion which judges said signal for a judgment outputted from said synchronizing signal detector by the 1st criterion which has one threshold, carries out the number of fixed hour meters of the number of the same judgment results concerning this judgment, and has a neutral zone When the input change-over signal of the picture signal which judges the existence of said synchronizing signal and includes the channel selection command of said television signal and the selection command of said video signal is inputted, The television receiver characterized by coming to prepare the control circuit which carries out the fixed time change of the width of face of said neutral zone to zero thru/or small width of face.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the television receiver which used this for the existence judging approach of an image synchronizing signal of judging the existence of the synchronizing signal contained in picture signals, such as a television signal and a video signal, and the synchronizing signal detection-system list using this.

[0002]

[Description of the Prior Art] In the common television set, various control is performed by checking the existence of an input of the television signal chosen by the channel etc. in the input terminal of a television signal. For example, control of making the channel which will judge the channel which displayed the whole screen blue, or has scanned and tuned in the tuner, or will not have the input of a television signal at the time of passing <a thing> on change-over actuation of a channel if there is no input of a television signal skip at the time of the next passing <a thing> on change-over actuation etc. is performed. Moreover, the existence of an input of picture signals, such as not only the existence of an input of a television signal but a video signal, is checked, and various control is performed similarly.

[0003] Many approaches by detecting the synchronizing signal contained in a picture signal on an input terminal as an approach of checking the existence of an input of picture signals, such as such a television signal, are adopted, and a Horizontal Synchronizing signal is usually used as the synchronizing signal.

[0004] Next, an example of an approach which detects the existence of the conventional synchronizing signal is explained. Usually, a noise component decreases the television signal inputted from an input terminal by the filter circuit, and the synchronizing signal contained in a television signal in a synchronizing

signal separation circuit is separated. The synchronizing signal separated by this synchronizing signal separation circuit is outputted to each part of a receiving set from an output terminal, after operating orthopedically by the circuit called a PLL circuit from not being stabilized by the strength or the noise of an electric wave, for example. This PLL circuit creates the synchronizing signal near the frequency of an original synchronizing signal with a synchronizing signal generator based on the clock of the variable frequency outputted from the oscillator of an armature-voltage control mold, compares the phase of that synchronizing signal and the synchronizing signal separated in the synchronizing signal separation circuit, and it adjusts the control voltage of said oscillator so that that phase contrast may be reduced. Consequently, the synchronizing signal outputted from the synchronizing signal generator of a PLL circuit turns into a stable synchronizing signal with which the phase was orthopedically operated in accordance with the synchronizing signal contained in a television signal. And if the synchronizing signal contained in a television signal is stabilized comparatively, and is inputted and this will be in the synchronizing signal generated from a PLL circuit, and a condition in phase (i.e., if locked by synchronization), the control voltage given to an oscillator from the phase comparator of a PLL circuit will be stabilized on the electrical potential difference of a certain proper which becomes settled with the frequency of a synchronizing signal. However, since picture signals, such as a television signal, are not inputted into an input terminal or a synchronizing signal is not detected in the case of a very weak signal, the control voltage of the value according to the time amount by which a synchronizing signal is not detected from a phase comparator will be inputted into an oscillator.

[0005] Then, observing the output of the phase comparator of a PLL circuit and judging the existence of a synchronizing signal conventionally, is proposed. For example, it can integrate with the control voltage outputted from a phase comparator with an integrator, and the existence of a synchronizing signal can be judged with the magnitude of the integral value. That is, the existence of a

synchronizing signal can be judged by making into a reference value the integral value (characteristic value) of the control voltage in the condition of having locked the synchronization, and comparing this with the integral value of actual control voltage. for example, the absolute value (the following and difference -- it is called a value.) of the difference of a reference value and the integral value of actual control voltage can be calculated, and the existence of a synchronizing signal can be judged by whether the ***** value is over the predetermined criterion value.

[0006] however, the ** by which the integral value of control voltage is not stabilized when one threshold is set as a criterion value -- difference -- if a value changes unstably, the judgment of the existence of a synchronizing signal may not be stabilized When having received the television signal of for example, a weak-electric-current community, this cannot separate a synchronizing signal correctly under the effect of the noise component which it cannot finish taking in a filter circuit, but when the control voltage outputted from a phase comparator becomes unstable, it may happen. In addition, it is appropriate to judge with such a condition having no synchronizing signal.

[0007] Then, in order to improve such an unstable judgment, it is common to make a criterion into the threshold which has a neutral zone instead of one threshold. namely, -- according to this -- difference -- since the last judgment result would be held while the value was included in the neutral zone, the judgment result of the synchronizing signal to a little fluctuation should be stabilized

[0008]

[Problem(s) to be Solved by the Invention] However, although the judgment result comparatively stabilized by setting a neutral zone as the criterion which judges existence of a synchronizing signal like the conventional technique can be obtained, there are the following problems.

[0009] for example, difference -- once a value goes into a judgment field without a synchronizing signal exceeding the upper limit of a neutral zone -- the

difference -- unless it goes into the judgment field with a synchronizing signal in which a value is less than the lower limit of a neutral zone, the judgment without a synchronizing signal will continue. therefore, difference smaller than the original criterion value corresponding to the integral value of the control voltage in the condition of having locked the synchronization -- since the judgment without a synchronizing signal is continued even if it is the case where it is stabilized in a value, there is a problem that normal image display cannot be performed.

[0010] that is, the difference which belongs in the width of face of a neutral zone - - when the channel of a weak-electric-current community which serves as a value exists, and it switches from the channel of the usual field strength to the channel of a weak-electric-current community, since the judgment with a synchronizing signal is obtained continuously, it is satisfactory, but when it switches from the channel of a non-signal to the channel of a weak-electric-current community, it becomes the judgment without a synchronizing signal and there is un-arranging [that the judgment result of synchronizing signal existence will change with how to switch a channel].

[0011] Moreover, the power up's having un-arranged [of surely becoming the judgment without a synchronizing signal], when the channel then chosen is a weak-electric-current community channel, since there is no synchronizing signal.

[0012] The technical problem which this invention tends to solve is to raise the validity thru/or stability of a judgment of synchronizing signal existence.

[0013]

[Means for Solving the Problem] The above-mentioned technical problem can be solved by carrying out the fixed time change of the width of face of said neutral zone to zero thru/or small width of face, when the existence of said synchronizing signal is judged by the criterion which has a neutral zone based on the signal for a judgment which detects the synchronizing signal contained in a picture signal, and is acquired and the input of said picture signal is switched.

[0014] That is, by setting a neutral zone as a criterion, as usual, the instability of a judgment of the synchronizing signal existence by a noise etc. can be avoided,

and the judgment result stabilized comparatively can be obtained in the usual condition. On the other hand, when the input of a picture signal is switched like the time of a switch with television and video, or a power up at the time of a switch of a channel From the width of face of the neutral zone of a criterion being changed into a criterion without zero, i.e., a neutral zone, by the neutral zone of modification or small width of face, also to the signal for a judgment of extent which belongs in the width of face of the usual neutral zone, it becomes possible to judge the existence of a synchronizing signal correctly, and an appropriate judgment can be performed. And since the criterion of a neutral zone is applied based on the judgment result before being returned even if returned after the fixed time amount at the original criterion, an appropriate judgment can be performed.

[0015] For example, when the channel of a weak-electric-current community where the signal for a judgment goes into the usual neutral zone exists When switched to the channel of a weak-electric-current community from the channel of a non-signal, or the condition of power-source OFF, according to the criterion which has the usual neutral zone, become the judgment the synchronizing signal made the mistake in being nothing continuously, but According to this invention, since the neutral zone of a criterion is changed into the thing of zero or small width of face at the time of such a switch, the judgment which made the mistake in being such can be reduced. That is, a judgment result with a synchronizing signal is brought. And since a judgment result with a synchronizing signal is held even if returned to the criterion which has the usual neutral zone after fixed time amount, validity is securable.

[0016] In the above-mentioned solution means, the physical quantity signal according to the number of the synchronizing signals detected in fixed time amount can be used as a signal for a judgment of a synchronizing signal. For example, the oscillator with which a means to detect the synchronizing signal contained in a picture signal generates the signal of the frequency according to the control voltage given, The synchronizing signal generator which generates

the synchronizing signal of the frequency according to the frequency of the signal outputted from the oscillator, The phase of the synchronizing signal outputted from the synchronizing signal generator and the synchronizing signal contained in a picture signal is compared, and when coming to have the phase comparator which controls the control voltage of said oscillator according to those phase contrast, physical quantity which integrated with the control voltage inputted into an oscillator can be made into the signal for a judgment. That is, the physical quantity which integrated with control voltage serves as a signal according to the phase contrast of two synchronizing signals, when the synchronizing signal contained in a picture signal cannot be detected, phase contrast is evaluated greatly substantially and the physical quantity which integrated with control voltage becomes many ****.

[0017] Moreover, it replaces with this, and when detecting a synchronizing signal and generating a pulse signal, the pulse can be used as a signal for a judgment. The criterion in this case sets up a pulse corresponding to the enumerated data acquired by carrying out the number of fixed hour meters.

[0018] Moreover, a criterion is set to two, and after judging by the 1st criterion which has one threshold, you may make it judge the existence of a synchronizing signal by the 2nd criterion which carries out the number of fixed hour meters of the number of the same judgment results concerning the judgment, and has one threshold. Even in such a case, when the input of a picture signal is switched, it is desirable to carry out the fixed time change of the threshold of the 2nd criterion to zero thru/or a small value. Or when a neutral zone is formed in the 2nd criterion and the input of a picture signal is switched, the fixed time change of the width of face of a neutral zone can be carried out to zero thru/or small width of face.

[0019] The circuit concerning the existence judging of the synchronizing signal mentioned above or the synchronous detection system using this can be easily formed using a discrete electronic circuitry or a discrete microprocessor, and even if it combines an electronic circuitry and a microprocessor, it can be formed

easily.

[0020] When the existence of a synchronizing signal is judged by the criterion which has a neutral zone based on the signal for a judgment which detects the synchronizing signal contained in a picture signal as other means to solve the above-mentioned technical problem, and is acquired and the input of a picture signal is switched, you may make it generate said signal for a judgment so that it may judge with those [said] with a synchronizing signal compulsorily during 1 scheduled time.

[0021]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained with reference to drawing. Drawing 1 is the block diagram of the synchronizing signal detection system which comes to apply the existence judging approach of the image synchronizing signal concerning the 1st operation gestalt of this invention. The input terminal 101 into which picture signals (the case of a television signal is hereafter explained to an example.), such as a television signal and a video signal, are inputted like illustration, A filter circuit 102, the synchronizing signal separation circuit 103, and a phase comparator 104, It is constituted by the output terminal 112 which outputs a synchronizing signal generator 105, the output terminal 106 of a synchronizing signal, an oscillator 107, an integrator 108, the input terminal 109 of a change-over signal, a control means 110, the synchronizing signal existence judging machine 111, and the judgment result of synchronizing signal existence. In addition, the circuit constituted by a filter circuit 102, the synchronizing signal separation circuit 103, the phase comparator 104, the synchronizing signal generator 105, the oscillator 107, and the integrator 108 shall be called the synchronizing signal detector 113. This synchronizing signal detector outputs the signal for judging synchronous existence from an integrator 108 while detecting a synchronizing signal from a television signal. Moreover, the circuit constituted with a phase comparator 104, a synchronizing signal generator 105, and an oscillator 107 is a PLL circuit.

[0022] Next, the detail configuration of the synchronizing signal detection system

of drawing 1 is explained with actuation. The noise component contained in a television signal decreases the television signal inputted from the input terminal 101 through a filter circuit 102, and it is inputted into the synchronizing signal separation circuit 103. The synchronizing signal separation circuit 103 detects the synchronizing signal of a horizontal synchronization from a television signal, and inputs it into a phase comparator 104. On the other hand, a synchronizing signal generator 105 is outputted to each part of a television receiver from an output terminal 106 while it creates the synchronizing signal which has a frequency according to the clock outputted from an oscillator 107 and inputs it into a phase comparator 104. A phase comparator 104 controls the control voltage of a transmitter 107 so that two inputted synchronizing signals become in phase. An oscillator 107 is an oscillator of the armature-voltage control mold which can control a dispatch frequency by control voltage from the outside. The control voltage of an oscillator 107 is stabilized on a fixed electrical potential difference, when two synchronizing signals inputted into the phase comparator 104 become in phase. The stabilization electrical potential difference is an electrical potential difference of a certain proper according to the predetermined frequency of a synchronizing signal. Moreover, it integrates with the control voltage outputted from a phase comparator 104 with an integrator 108, and it is inputted into the synchronizing signal existence judging machine 111 as a signal for a judgment of synchronizing signal existence.

[0023] Here, the detail configuration of the synchronizing signal existence judging machine 111 and a control means 110 is explained with actuation. The reference value equivalent to the output signal of the integrator 108 in the condition to which two synchronizing signals became in phase in the synchronizing signal detector 113, i.e., the condition of having locked the synchronization, is set to the synchronizing signal existence judging machine 111. and the synchronizing signal existence judging machine 111 samples the signal for a judgment outputted from an integrator 108 (for example, 60 times per second), and calculates the absolute value (this -- difference -- a value D is called.) of the

difference of the sampled signal for a judgment, and its reference value.
moreover -- the synchronizing signal existence judging machine 111 -- difference
-- two kinds of criteria a and b which judge the existence of a synchronizing
signal based on a value D are set up. These criteria a and b are shown in
drawing 2 (a) and (b), respectively. the difference which searched for Criterion a
by this sampling -- a value D is compared with threshold Q, and as shown in
drawing 2 (a), a judgment result with a synchronizing signal is outputted at the
time of synchronizing signal nothing and $D < Q$ at the time of $D \geq Q$. the difference
which searched for Criterion b by the sampling of close this time on the other
hand -- as a value D is compared with two thresholds P and Q (however, $P > Q$)
and it is shown in drawing 2 (b), at the time of $D \geq Q$, a judgment result without a
synchronizing signal is outputted, and when a judgment result with a
synchronizing signal is outputted and it is in the range of $P \leq D < Q$, it holds to the
judgment result at the time of the last sampling at the time of $D < P$. That is, as for
Criterion b, the so-called neutral zone of P-Q width of face is set up. And at the
time, the synchronizing signal existence judging machine 111 is usually set up so
that it may judge by Criterion b.

[0024] On the other hand, the change-over signal which shows that the input of a
television signal was switched from the input terminal 109 is inputted into a
control means 110. That is, this change-over signal shows that the television
signal inputted from an input terminal 101 switched, and is a channel change-
over signal, the change-over signal of television/video, an ON signal of a power
source, etc. When the change-over signal is inputted, a control means 110
judges that the television signal switched, and outputs the command to which the
criterion of the synchronizing signal existence judging machine 111 is changed to
the synchronizing signal existence judging machine 111. That is, when the
change-over signal is inputted, the command to which Criterion b is made to
change into Criterion a is outputted to the synchronizing signal existence judging
machine 111, and the output of the command is suspended after fixed time
amount progress.

[0025] the difference which the synchronizing signal existence judging machine 111 switches a criterion to a immediately from b, and is sampled following the command of such a control means 110 -- synchronizing signal existence is judged using Criterion a about a value D. And a criterion is returned to the original criterion b following a halt of the switch command after fixed time amount.

[0026] Thereby, when a television signal switches, the television signal at the time of switching the condition of the judgment result of the synchronizing signal existence judging machine 111 can be updated to the judgment result by the criterion a without a neutral zone. Last time the judgment result by Criterion a then, as a judgment result at the time of a sampling since synchronizing signal existence will be judged using Criterion b -- difference -- $D=X$ by which a value D goes into width-of-face P-Q of a neutral zone, even if switched to the television signal of a weak-electric-current community [like] While being able to obtain the right judging result of those with a synchronizing signal, without being influenced last time by the judgment result about $D=Y$ at the time of a sampling (for example, non-signal), the stable distinction result can be obtained.

[0027] In addition, although the example which makes the physical quantity signal which integrated with the control voltage value of the oscillator 107 of the synchronizing signal detector 113 the signal for a judgment in the synchronizing signal detection system of drawing 1 , and judges synchronizing signal existence based on this was shown This invention is applicable if it is the synchronizing signal detector of a configuration of outputting the physical quantity signal according to the number of the signals which show the condition of the existence of not only this but a synchronizing signal, for example, the synchronizing signal detected in fixed time amount. For example, since the frequency of a Horizontal Synchronizing signal is set to 15.75Hz by specification, it detects and counts a synchronizing signal with the clock of the frequency, and you may make it use the counted value. The counted value within fixed time amount can judge by whether it is beyond a predetermined value, and the criterion in this case can form a neutral zone in a criterion similarly. In addition, for example, when the

number of the scanning lines is set to 525 per frame, the scanning line can be counted and the existence of a synchronizing signal can be detected.

[0028] The block diagram of the synchronizing signal detection system which comes to apply the existence judging approach of the image synchronizing signal concerning the 2nd operation gestalt of this invention to drawing 3 is shown. As shown in this drawing, the system concerning the gestalt of this operation is constituted by the input terminal 101 of a television signal, the synchronizing signal detector 113, the synchronizing signal existence judging machine 201, a control means 202, the output terminal 112 of a synchronous existence judging result, and the synchronizing signal output terminal 106. This operation gestalt is an example when the criterion of the synchronizing signal existence judging machine 201 being fixed to Criterion a, and being unable to change.

[0029] Next, the detailed configuration of the gestalt of this operation is explained with actuation. In drawing 3, the same sign is given to the operation gestalt of drawing 1, and an equal thing, and the explanation is omitted. The signal for a judgment of the synchronizing signal existence outputted from the synchronizing signal detector 113 is inputted into the synchronizing signal existence judging machine 201. The synchronizing signal existence judging machine 201 cannot change the criterion, but by the criterion a shown in drawing 2 (a), synchronizing signal existence is judged and the judgment result is inputted into a control means 202. In order that a control means 202 may stabilize the judgment result inputted from the synchronizing signal existence judging machine 201, based on the signal of a judgment result inputted, synchronizing signal existence is judged again. Moreover, the criterion of the synchronizing signal existence in a control means 202 can be changed now by the command given from the outside. That is, it has the criterion equivalent to two criteria a and b shown in drawing 2. And the judgment result outputted from a control means 201 is outputted to each part of a television receiver from an output terminal 112.

[0030] Especially the judgment of the synchronizing signal existence in a control means 202 samples the judgment result from the synchronizing signal existence

judging machine 201, counts the number of the same judgment results within the time amount set to arbitration (those with a synchronizing signal, or count of detection of a judgment result without a synchronizing signal), and judges it as compared with the number and threshold of Criteria a and b. The same effectiveness as it is acquired by controlling this criterion by the change-over signal from the outside, as the 1st operation gestalt described.

[0031] The block diagram of the synchronizing signal detection system which comes to apply the existence judging approach of the image synchronizing signal concerning the 3rd operation gestalt of this invention to drawing 4 is shown. As shown in this drawing, the system of this operation gestalt is constituted by the input terminal 101 of a television signal, the signal change-over circuit 301, the synchronizing signal detector 302, the synchronizing signal existence judging machine 303, the control means 304, the output terminal 112 of a synchronizing signal existence judging result, and the synchronizing signal output terminal 106. The criterion of the synchronizing signal existence judging machine 302 is being fixed to the criterion b of drawing 2, and this operation gestalt is an example when the ability not to change.

[0032] Thus, the detail configuration of the synchronizing signal detection system of drawing 4 constituted is explained with actuation. The television signal inputted from the input terminal 101 is inputted into the signal change-over circuit 301. Moreover, the synchronizing signal outputted from the synchronizing signal detector 302 is inputted into the signal change-over circuit 301. The signal change-over circuit 301 outputs the signal chosen by the control means 304 from from to the synchronizing signal detector 302 among the television signals inputted from the synchronizing signal outputted from the synchronizing signal detector 302, and an input terminal 101. In addition to the function of the synchronizing signal detector 113 shown in drawing 1, the synchronizing signal detector 302 has the function which can intercept the control voltage of an oscillator according to the control command given from the external control means 304, and it is constituted so that the synchronizing signal of a free run can

be outputted by this. The synchronizing signal outputted from the synchronizing signal detector 302 is inputted into the synchronizing signal existence judging machine 303. The judgment result judged with the synchronizing signal existence judging machine 303 is outputted from an output terminal 112. The criterion cannot control the synchronizing signal existence judging machine 303 from the outside, but it performs a synchronous existence judging by Criterion b. A control means 304 controls the signal change-over circuit 301 and the synchronizing signal detector 302 based on the change-over signal inputted from an input terminal 109.

[0033] Here, detailed actuation of a control means 304 is explained. At the time of usual, a control means 304 is controlled so that the television signal inputted from an input terminal 101 is inputted into the synchronizing signal detector 302. And first, if the change-over signal which shows that the television signal switched is inputted into a control means 304, it will control so that the synchronizing signal detector 302 outputs the synchronizing signal of a free run. Furthermore, the signal change-over circuit 301 is controlled so that the synchronizing signal of this free run is inputted into the synchronizing signal detector 302. Since the synchronizing signal same at this time as the synchronizing signal which self is outputting to the synchronizing signal detector 302 is inputted, the synchronizing signal detector 302 outputs the signal for a judgment equivalent to those with a synchronizing signal. This signal for a judgment is the same as that of the output of the integrator 108 of drawing 1 . Therefore, the synchronizing signal existence judging machine 303 will output a judgment result with a synchronizing signal. After the passage of time set as arbitration, a control means 302 controls the signal change-over circuit 301 to make the television signal from an input terminal 101 input into the synchronizing signal detector 302 while outputting the command which stops a free run to the synchronizing signal detector 302. It is possible to judge synchronizing signal existence from a non-signal correctly to the television signal change ***** case of a weak-electric-current community by this control, as the example of the

conventional technique described since the synchronizing signal existence judging machine 303 is compulsorily changed into the condition with synchronous when a television signal switches.

[0034] The block diagram concerning the 4th operation gestalt at the time of applying the existence judging approach of the image synchronizing signal which starts this invention at drawing 5 to a wide television receiver is shown. Like illustration, a wide television receiver The RF-signal input terminal 401, a tuner 402, and the signal change-over circuit 403, The Y/C separation circuit 404, the color demodulator circuit 405, and the time-base-compaction circuit 406, The RGB code processing circuit 407, the deviation control circuit 408, and CPT409, It consists of the video signal input terminal 410, the control signal input terminal 411 from the outside, such as remote control, a system control means 412 to control the whole wide television set, a screen-display control circuit 413, a synchronizing signal detector 302, and a synchronizing signal existence judging circuit 111. In addition, the block which attached the same sign as the gestalt of other operations has the same functional configuration.

[0035] Next, actuation of the wide television receiver shown in drawing 5 is explained. The RF signal inputted from the RF-signal input terminal 401 is changed into a television signal by the tuner 402, and is inputted into the signal change-over circuit 403. Moreover, the television signal (video signal) inputted from the video signal input terminal 410 is inputted into the signal change-over circuit 403. The signal change-over circuit 403 inputs into the Y/C separation circuit 404 and the synchronizing signal detector 302 the television signal which is making display selection with the system control means 412. The television signal inputted into the Y/C separation circuit 404 is inputted into CPT409 through the color demodulator circuit 405, the time-base-compaction circuit 406, the RGB code processing circuit 407, and the deviation control circuit 408, and is displayed as an image.

[0036] On the other hand, the synchronizing signal detector 302 inputs the signal for a judgment of synchronizing signal existence (output signal of the integrator

108 of drawing 1) into the synchronizing signal existence judging circuit 111 while it detects a synchronizing signal from the inputted television signal and inputs it into the RGB code processing circuit 407. The synchronizing signal existence judging circuit 111 judges the existence of a synchronizing signal based on the signal for a judgment sampled by the same criteria a and b as the operation gestalt of drawing 1 , and inputs the judgment result into the system control means 412. The system control means 412 performs a channel change-over and an input change-over with the control signal (change-over signal) from the outside, such as remote control inputted from an input terminal 411. Since the television signal inputted into the synchronizing signal detector 302 to compensate for this change-over switches, the criterion of the synchronizing signal existence judging circuit 111 is controlled like the operation gestalt of drawing 1 .

[0037] This operation gestalt is an operation gestalt at the time of including functional actuation of the control means 110 in the operation gestalt of drawing 1 in the system control means 412 which controls the whole wide television. Moreover, when the synchronizing signal existence judging circuit 201 of the 2nd operation gestalt of drawing 3 R> 3 is applied as a synchronizing signal existence judging circuit 111, this invention can be carried out by performing functional actuation of a control means 202 with the system control means 412.

[0038] The block diagram concerning the 5th operation gestalt at the time of using this invention for a wide television receiver at drawing 6 is shown. This operation gestalt adds the signal change-over circuit 501 to the operation gestalt of drawing 5 , and transposes the synchronizing signal existence judging circuit 111 and the system control means 412 to the synchronizing signal existence judging circuit 303 and the system control means 502, respectively. Control cannot do a criterion from the exterior, but it fixes to Criterion b, and the synchronizing signal existence judging circuit 303 judges synchronizing signal existence, as the 3rd operation gestalt of drawing 4 described. At this time, the system control means 502 can carry out this invention like a control means 304

by controlling the signal change-over circuit 501 and the synchronizing signal detector 302.

[0039]

[Effect of the Invention] As explained above, according to this invention, the validity and stability of a judgment of synchronizing signal existence can be raised.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the block diagram of the synchronizing signal detection system which comes to apply the existence judging approach of the image synchronizing signal of the 1st operation gestalt of this invention.

[Drawing 2] It is drawing explaining the criterion of the existence judging approach of the image synchronizing signal concerning this invention.

[Drawing 3] It is the block diagram of the synchronizing signal detection system which comes to apply the existence judging approach of the image synchronizing signal of the 2nd operation gestalt of this invention.

[Drawing 4] It is the block diagram of the synchronizing signal detection system

which comes to apply the existence judging approach of the image synchronizing signal of the 3rd operation gestalt of this invention.

[Drawing 5] It is the block diagram of the wide television receiver which comes to apply the existence judging approach of the image synchronizing signal of the 1st operation gestalt of this invention.

[Drawing 6] It is the block diagram of the wide television receiver which comes to apply the existence judging approach of the image synchronizing signal of the 3rd operation gestalt of this invention.

[Description of Notations]

102 Filter Circuit

103 Synchronizing Signal Separation Circuit

104 Phase Comparator

105 Synchronizing Signal Generator

107 Oscillator

108 Integrator

110 Control Means

111 Synchronizing Signal Existence Judging Machine

113 Synchronizing Signal Detector

201 Synchronizing Signal Existence Judging Machine

202 Control Means

301 Signal Change-over Circuit

302 Synchronizing Signal Detector

303 Synchronizing Signal Existence Judging Circuit

304 Control Means

401 RF-Signal Input Terminal

402 Tuner

403 Signal Change-over Circuit

404 Y/C Separation Circuit

405 Color Demodulator Circuit

406 Time-Base-Compaction Circuit

407 RGB Code Processing Circuit
408 Deviation Control Circuit
409 CRT
410 Video Input Terminal
411 Control Signal Input Terminal
412 System Control Means
413 Screen-Display Control Circuit
501 Signal Change-over Circuit
502 System Control Means

[Translation done.]

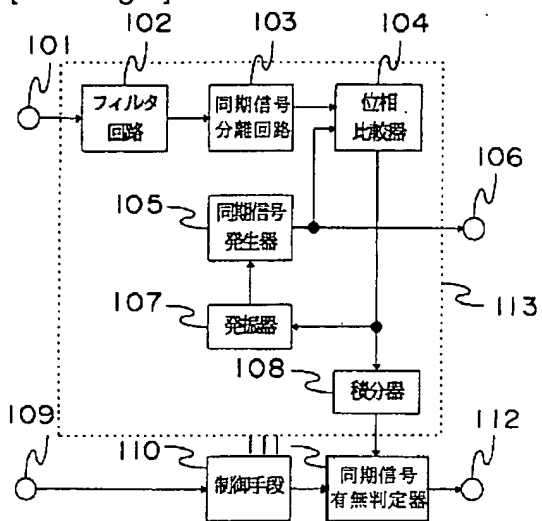
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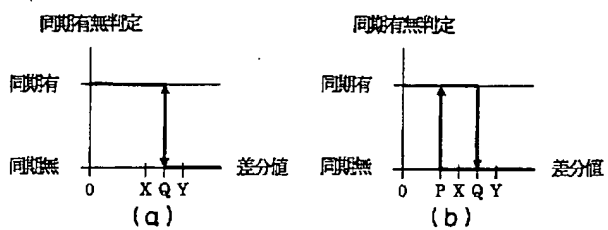
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DRAWINGS

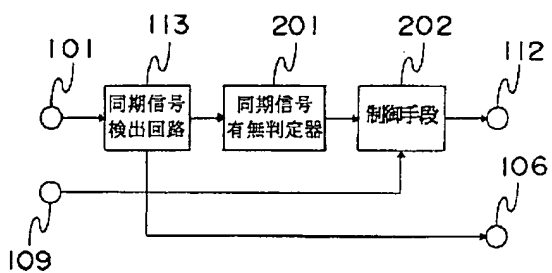
[Drawing 1]



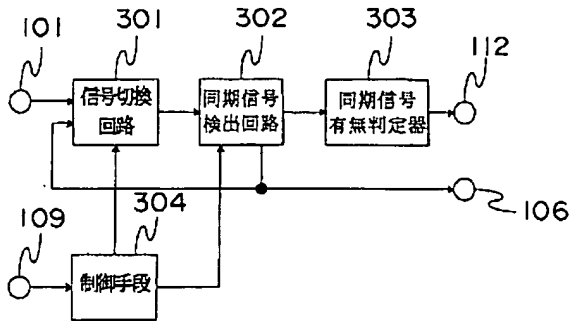
[Drawing 2]



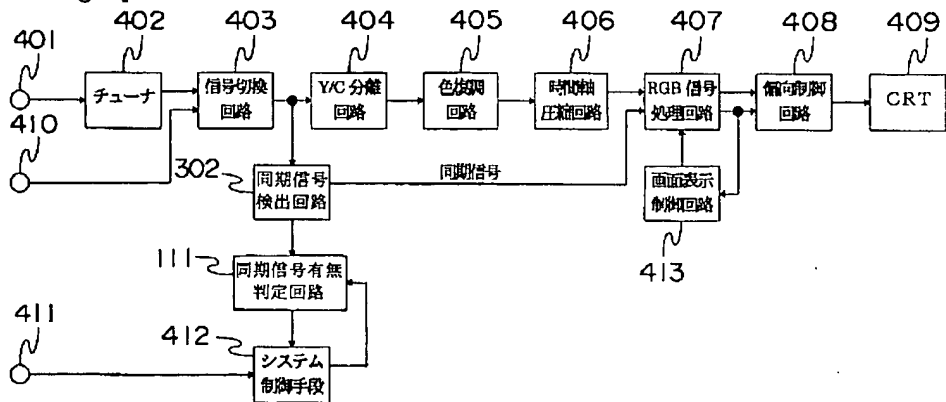
[Drawing 3]



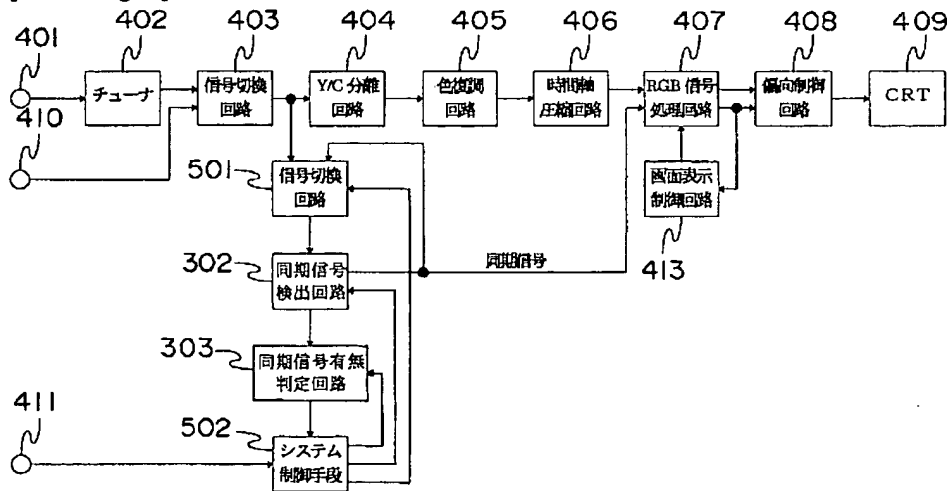
[Drawing 4]



[Drawing 5]



[Drawing 6]



[Translation done.]

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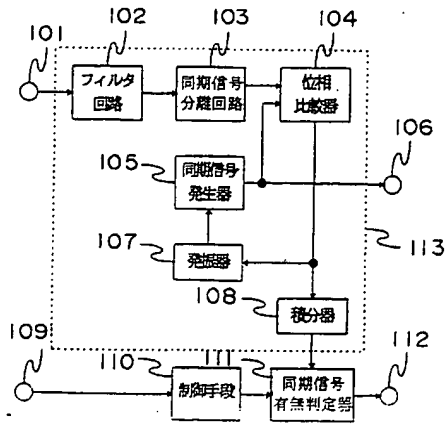
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(54) 【発明の名称】 画像同期信号の有無判定方法及び同期信号検出システム

(57) 【要約】

【課題】 同期信号有無の判定の妥当性及び安定性を向上する。

【解決手段】 画像信号に含まれる同期信号を検出し、一定時間内に検出された同期信号の数に応じた物理量の判定用信号を出力する同期信号検出手段113と、該同期信号検出手段から出力される前記判定用信号を判定基準と比較して前記同期信号の有無を判定する判定手段112とを備え、この判定手段の判定基準は可変幅の不感帯が設定されてなり、その不感帯の幅を画像信号の入力が切り換えられた信号が入力されたときに、一定時間零乃至小さな幅に変更する制御手段110を設け、通常時は不感帯を有する判定基準によって安定な判定を実現し、画像信号の切り換え時にはその不感帯の幅を小さくして、無信号のチャンネルから弱電界のチャンネルに切り換えられたときでも、妥当な判定を行えるようにする。



【特許請求の範囲】

【請求項1】 画像信号に含まれる同期信号を検出して得られる判定用信号に基づいて、前記同期信号の有無を不感帯を有する判定基準により判定し、前記画像信号の入力が切り換えられたとき、前記不感帯の幅を零乃至小さな幅に一定時間変更する画像同期信号の有無判定方法。

【請求項2】 請求項1に記載の画像同期信号の有無判定方法において、前記判定用信号が、一定時間内に検出される前記同期信号の数に応じた物理量であることを特徴とする画像同期信号の有無判定方法。

【請求項3】 請求項1に記載の画像同期信号の有無判定方法において、前記判定用信号が、前記同期信号が検出されたときに発生されるパルス信号であり、前記判定基準が、前記パルス信号を一定時間計数して得られる計数値に対応して設定されることを特徴とする画像同期信号の有無判定方法。

【請求項4】 画像信号に含まれる同期信号を検出して得られる判定用信号に基づいて、前記同期信号の有無を1つのしきい値を有する第1の判定基準により判定し、該判定に係る同一の判定結果の数を一定時間計数して1つのしきい値を有する第2の判定基準により前記同期信号の有無を判定し、前記画像信号の入力が切り換えられたとき、前記第2の判定基準のしきい値を零乃至小さな値に一定時間変更する画像同期信号の有無判定方法。

【請求項5】 画像信号に含まれる同期信号を検出して得られる判定用信号に基づいて、前記同期信号の有無を1つのしきい値を有する第1の判定基準により判定し、該判定に係る同一の判定結果の数を一定時間計数して不感帯を有する第2の判定基準により前記同期信号の有無を判定し、前記画像信号の入力が切り換えられたとき、前記不感帯の幅を零乃至小さな幅に一定時間変更する画像同期信号の有無判定方法。

【請求項6】 請求項4又は5に記載の画像同期信号の有無判定方法において、前記判定用信号が、一定時間内に検出される前記同期信号の数に応じた物理量であることを特徴とする画像同期信号の有無判定方法。

【請求項7】 画像信号に含まれる同期信号を検出し、一定時間内に検出された同期信号の数に応じた物理量の判定用信号を出力する同期信号検出手段と、前記判定用信号を判定基準と比較して前記同期信号の有無を判定する判定手段とを備えてなる同期信号検出システムにおいて、前記判定手段の判定基準は可変幅の不感帯が設定されて

なり、
該不感帯の幅を前記画像信号の入力が切り換えられた信号が入力されたときに、一定時間零乃至小さな幅に変更する制御手段を設けたことを特徴とする同期信号検出システム。

【請求項8】 請求項7に記載の同期信号検出システム

において、

前記同期信号検出手段は、与えられる制御電圧に応じた周波数の信号を発生する発振器と、該発振器から出力される信号の周波数に応じた周波数の同期信号を発生する同期信号発生器と、該同期信号発生器から出力される同期信号と画像信号に含まれる同期信号の位相を比較し、それらの位相差に応じて前記発振器の制御電圧を制御する位相比較器と、前記制御電圧を積分して前記判定用信号を出力する積分手段とを有してなることを特徴とする同期信号検出システム。

【請求項9】 請求項7に記載の同期信号検出システムにおいて、

前記同期信号検出手段は、前記同期信号の所定の周期に合わせて前記画像信号に含まれる同期信号が入力されたか否かを検出し、前記同期信号が検出される度にパルス信号を前記判定用信号として出力するものであることを特徴とする同期信号検出システム。

【請求項10】 画像信号に含まれる同期信号を検出し、一定時間内に検出された同期信号の数に応じた物理量の判定用信号を出力する同期信号検出手段と、前記判定用信号を取り込んで判定基準と比較して前記同期信号の有無を判定する判定手段とを備えてなる同期信号検出システムにおいて、

前記判定手段は、前記同期信号検出手段から出力される前記判定用信号を1つのしきい値を有する第1の判定基準により判定し、該判定に係る同一の判定結果の数を一定時間計数して1つのしきい値を有する第2の判定基準により、前記同期信号の有無を判定するものであり、前記画像信号の入力が切り換えられたとき、前記第2の判定基準のしきい値を零乃至小さな値に一定時間変更する制御手段を設けてなることを特徴とする同期信号検出システム。

【請求項11】 画像信号に含まれる同期信号を検出し、一定時間内に検出された同期信号の数に応じた物理量の判定用信号を出力する同期信号検出手段と、前記判定用信号を取り込んで判定基準と比較して前記同期信号の有無を判定する判定手段とを備えてなる同期信号検出システムにおいて、

前記判定手段は、前記同期信号検出手段から出力される前記判定用信号を1つのしきい値を有する第1の判定基準により判定し、該判定に係る同一の判定結果の数を一定時間計数して不感帯を有する第2の判定基準により、前記同期信号の有無を判定するものであり、前記画像信号の入力が切り換えられたとき、前記不感帯の幅を零乃至小さな幅に一定時間変更する制御手段を設けてなることを特徴とする同期信号検出システム。

【請求項12】 請求項10又は11に記載の同期信号検出システムにおいて、

前記同期信号検出手段は、与えられる制御電圧に応じた周波数の信号を発生する発振器と、該発振器から出力さ

れる信号の周波数に応じた周波数の同期信号を発生する同期信号発生器と、該同期信号発生器から出力される同期信号と画像信号に含まれる同期信号の位相を比較し、それらの位相差に応じて前記発振器の制御電圧を制御する位相比較器と、前記制御電圧を積分して前記判定用信号を出力する積分手段とを有してなることを特徴とする同期信号検出システム。

【請求項13】 画像信号に含まれる同期信号を検出して得られる判定用信号に基づいて、前記同期信号の有無を不感帯を有する判定基準により判定し、前記画像信号の10 入力切り換えられたとき、一定時間強制的に前記同期信号有り判定する画像同期信号の有無判定方法。

【請求項14】 信号切換手段と、同期信号検出手段と、同期信号有無判定手段と、制御手段とを備え、前記同期信号検出手段は、与えられる制御電圧に応じた周波数の信号を発生する発振器と、該発振器から出力される信号の周波数に応じた周波数の同期信号を発生する同期信号発生器と、該同期信号発生器から出力される同期信号と画像信号に含まれる同期信号の位相を比較し、それらの位相差に応じて前記発振器の制御電圧を制御する位相比較器と、前記制御電圧を積分して判定用信号を出力する積分手段と、前記発振器に入力される制御電圧を遮断する手段とを備え、前記同期信号発生器から出力される同期信号をテレビジョン受像機の各部に出力するものであり、

前記信号切換手段は、画像信号とともに入力される同期信号と前記同期信号検出手段から出力される同期信号とを与えられる指令に従って切り換え出力するものであり、

前記判定手段は、前記同期信号検出手段から出力される前記判定用信号を一定の不感帯を有する判定基準と比較して前記同期信号の有無を判定するものであり、前記制御手段は、画像信号の入力切り換えられたときに前記同期信号検出手段に前記制御電圧の遮断指令を出力するとともに、前記切換手段に前記同期信号検出手段から出力される同期信号を出力させる切換指令を出力するものであることを特徴とする同期信号検出システム。

【請求項15】 入力されるRF信号をテレビジョン信号に変換するチューナと、入力されるビデオ信号と前記チューナから出力されるテレビジョン信号とを切り換えて一方の画像信号を出力する信号切換回路と、該信号切換回路から出力される画像信号を処理するY/C分離回路、色復調回路及びRGB信号処理回路と、該RGB信号処理回路から出力される画像信号に応じてCRTを制御して当該CRTに画像を表示する偏向制御回路と、前記信号切換回路から出力される画像信号に含まれる同期信号を検出し、一定時間内に検出された同期信号の数に応じた物理量の判定用信号を出力する同期信号検出回路と、前記判定用信号を判定基準と比較して前記同期信号の有無を判定する判定回路とを備え、前記同期信号の有

無判定に基づいて画像表示制御を行うテレビジョン受像機において、

前記判定回路の判定基準は可変幅の不感帯が設定されており、前記テレビジョン信号の選局指令と前記ビデオ信号の選択指令を含む画像信号の入力切換信号が入力されたとき、前記不感帯の幅を一定時間零乃至小さな幅に変更する制御手段を設けたことを特徴とするテレビジョン受像機。

【請求項16】 入力されるRF信号をテレビジョン信号に変換するチューナと、入力されるビデオ信号と前記チューナから出力されるテレビジョン信号とを切り換えて一方の画像信号を出力する信号切換回路と、該信号切換回路から出力される画像信号を処理するY/C分離回路、色復調回路及びRGB信号処理回路と、該RGB信号処理回路から出力される画像信号に応じてCRTを制御して当該CRTに画像を表示する偏向制御回路と、前記信号切換回路から出力される画像信号に含まれる同期信号を検出し、一定時間内に検出された同期信号の数に応じた物理量の判定用信号を出力する同期信号検出回路と、前記判定用信号を判定基準と比較して前記同期信号の有無を判定する判定回路とを備え、前記同期信号の有無判定に基づいて画像表示制御を行うテレビジョン受像機において、

前記判定回路は、前記同期信号検出回路から出力される前記判定用信号を1つのしきい値を有する第1の判定基準により判定し、該判定に係る同一の判定結果の数を一定時間計数して1つのしきい値を有する第2の判定基準により、前記同期信号の有無を判定するものであり、前記テレビジョン信号の選局指令と前記ビデオ信号の選択指令を含む画像信号の入力切換信号が入力されたとき、前記第2の判定基準のしきい値を零乃至小さな値に一定時間変更する制御回路を設けてなることを特徴とするテレビジョン受像機。

【請求項17】 入力されるRF信号をテレビジョン信号に変換するチューナと、入力されるビデオ信号と前記チューナから出力されるテレビジョン信号とを切り換えて一方の画像信号を出力する信号切換回路と、該信号切換回路から出力される画像信号を処理するY/C分離回路、色復調回路及びRGB信号処理回路と、該RGB信号処理回路から出力される画像信号に応じてCRTを制御して当該CRTに画像を表示する偏向制御回路と、前記信号切換回路から出力される画像信号に含まれる同期信号を検出し、一定時間内に検出された同期信号の数に応じた物理量の判定用信号を出力する同期信号検出回路と、前記判定用信号を判定基準と比較して前記同期信号の有無を判定する判定回路とを備え、前記同期信号の有無判定に基づいて画像表示制御を行うテレビジョン受像機において、

前記判定回路は、前記同期信号検出回路から出力される前記判定用信号を1つのしきい値を有する第1の判定基

値により判定し、該判定に係る同一の判定結果の数を一定時間計数して不感帯を有する第2の判定基準により、前記同期信号の有無を判定するものであり、前記テレビジョン信号の選局指令と前記ビデオ信号の選択指令を含む画像信号の入力切換信号が入力されたとき、前記不感帯の幅を零乃至小さな幅に一定時間変更する制御回路を設けてなることを特徴とするテレビジョン受信機。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、テレビジョン信号やビデオ信号等の画像信号に含まれる同期信号の有無を判定する画像同期信号の有無判定方法、これを用いた同期信号検出システム並びにこれを用いたテレビジョン受信機に関するものである。

【0002】

【従来の技術】一般のテレビジョン受信機では、チャンネル等により選択されたテレビジョン信号の入力の有無を、テレビジョン信号の入力端子において確認することにより種々の制御を行っている。例えば、テレビジョン信号の入力がなければ画面の全体を青色に表示すると、チューナをスキャンして選局されているチャンネル等を判定すると、チャンネルの順送り切換操作のときにテレビジョン信号の入力がないチャンネルは、次の順送り切換操作のときにはスキップさせる等の制御が行われている。また、テレビジョン信号の入力の有無だけでなく、ビデオ信号等の画像信号の入力の有無を確認して、同様に種々の制御を行っている。

【0003】このようなテレビジョン信号等の画像信号の入力の有無を確認する方法としては、画像信号に含まれる同期信号を入力端子上において検出することによる方法が多く採用されており、その同期信号として通常は水平同期信号が用いられる。

【0004】次に、従来の同期信号の有無を検出する方法の一例を説明する。通常、入力端子から入力されるテレビジョン信号は、フィルタ回路によりノイズ成分が減衰され、同期信号分離回路においてテレビジョン信号に含まれる同期信号が分離される。この同期信号分離回路により分離される同期信号は、電波の強弱やノイズによって安定しないことから、例えば、PLL回路と称する回路により整形した後、出力端子から受信機の各部に出力される。このPLL回路は、電圧制御型の発振器から出力される可変周波数のクロックに基づいて同期信号発生器にて本来の同期信号の周波数に近い同期信号を作成し、その同期信号と同期信号分離回路で分離された同期信号の位相を比較し、その位相差を低減するように前記発振器の制御電圧を調整するものである。その結果、PLL回路の同期信号発生器から出力される同期信号は、テレビジョン信号に含まれる同期信号に位相が一致し、かつ整形された安定な同期信号となる。そして、テレビ

ジョン信号に含まれる同期信号が比較的安定して入力され、これがPLL回路から発生される同期信号と同位相の状態になると、つまり同期がロックした状態になると、PLL回路の位相比較器から発振器に与えられる制御電圧は、同期信号の周波数により定まるある固有の電圧で安定する。しかし、入力端子にテレビジョン信号等の画像信号が入力されなかったり、非常に弱い信号の場合は同期信号が検出されないため、位相比較器から同期信号が検出されない時間に応じた値の制御電圧が発振器に入力されることになる。

【0005】そこで、従来、PLL回路の位相比較器の出力を観察して、同期信号の有無を判断することが提案されている。例えば、位相比較器から出力される制御電圧を積分器により積分し、その積分値の大きさにより同期信号の有無を判定することができる。つまり、同期がロックした状態における制御電圧の積分値（固有値）を基準値とし、これと実際の制御電圧の積分値とを比較することにより、同期信号の有無を判定することができる。例えば、基準値と実際の制御電圧の積分値との差の絶対値（以下、差分値という。）を求め、その差分値が所定の判定基準値を超えているか否かにより、同期信号の有無を判定することができる。

【0006】しかし、1つのしきい値を判定基準値に設定した場合、制御電圧の積分値が安定せずに差分値が不安定に変化すると、同期信号の有無の判定が安定しないことがある。これは、例えば、弱電界のテレビジョン信号を受信している時に、フィルタ回路で取りきれないノイズ成分の影響で同期信号の分離が正しく行えず、位相比較器から出力される制御電圧が不安定になることによって起こり得る。なお、このような状態は、同期信号無しと判定するのが妥当である。

【0007】そこで、そのような不安定な判定を改善するため、判定基準を1つのしきい値ではなく、不感帯を有するしきい値とすることが一般的である。すなわち、これによれば、差分値が不感帯に含まれる間は、前回の判定結果を保持することになるから、少々の変動に対する同期信号の判定結果を安定したものとすることができる。

【0008】

【発明が解決しようとする課題】しかしながら、従来技術のように、同期信号の有無の判定を行う判定基準に不感帯を設定することにより、比較的安定した判定結果を得ることができるが、次のような問題がある。

【0009】例えば、差分値が不感帯の上限値を超えて同期信号無しの判定領域に一度入ると、その差分値が不感帯の下限値を下回る同期信号有りの判定領域に入らない限り、同期信号無しの判定が継続することになる。そのため、同期がロックした状態における制御電圧の積分値に対応する本来の判定基準値よりも小さな差分値で安定した場合であっても、同期信号無しの判定が継続され

るため、正常な画像表示を行えないという問題がある。
【0010】つまり、不感帯の幅内に属する差分值となるような弱電界のチャンネルが存在する場合、通常の電界強度のチャンネルから弱電界のチャンネルに切り換えた場合は、継続して同期信号有りの判定が得られるので問題ないが、無信号のチャンネルから弱電界のチャンネルに切り換えた場合は、同期信号無しの判定になってしまい、チャンネルの切り換え方によって同期信号有無の判定結果が異なってしまうという不都合がある。

【0011】また、電源投入時は同期信号が無いから、その時選択されているチャンネルが弱電界チャンネルである場合、必ず同期信号無しの判定になってしまうという不都合がある。

【0012】本発明が解決しようとする課題は、同期信号有無の判定の妥当性乃至安定性を向上させることにある。

【0013】

【課題を解決するための手段】上記課題は、画像信号に含まれる同期信号を検出して得られる判定用信号に基づいて、前記同期信号の有無を不感帯を有する判定基準により判定し、前記画像信号の入力が切り換えられたとき、前記不感帯の幅を零乃至小さな幅に一定時間変更することにより、解決することができる。

【0014】すなわち、判定基準に不感帯を設定することにより、通常の状態においては、従来と同様に、ノイズなどによる同期信号有無の判定の不安定性を回避して、比較的安定した判定結果を得ることができる。一方、チャンネルの切り換え時、テレビジョンとビデオとの切り換え時、あるいは電源投入時等のように、画像信号の入力が切り換えられたときは、判定基準の不感帯の幅が、零、すなわち不感帯なしの判定基準に変更、又は小さな幅の不感帯に変更されることから、通常の不感帯の幅内に属する程度の判定用信号に対しても、同期信号の有無を正しく判定することが可能になり、妥当な判定を行うことができる。そして、その一定時間後に元の判定基準に戻されても、戻される前の判定結果に基づいて不感帯の判定基準が適用されるから、妥当な判定を行うことができる。

【0015】例えば、判定用信号が通常の不感帯に入ってしまうような弱電界のチャンネルが存在する場合に、無信号のチャンネルあるいは電源オフの状態から弱電界のチャンネルに切り換えられた場合、通常の不感帯を有する判定基準によれば、継続して同期信号無しの誤った判定になるが、本発明によれば、そのような切り換え時に判定基準の不感帯が零又は小さな幅のものに変更されるので、そのような誤った判定を低減できる。つまり、同期信号有りの判定結果になる。そして、一定時間後には通常の不感帯を有する判定基準に戻されても、同期信号有りの判定結果が保持されるので、妥当性を確保することができる。

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【0016】上記の解決手段において、同期信号の判定用信号として、一定時間内に検出される同期信号の数に応じた物理量信号を用いることができる。例えば、画像信号に含まれる同期信号を検出する手段が、与えられる制御電圧に応じた周波数の信号を発生する発振器と、その発振器から出力される信号の周波数に応じた周波数の同期信号を発生する同期信号発生器と、その同期信号発生器から出力される同期信号と画像信号に含まれる同期信号の位相を比較し、それらの位相差に応じて前記発振器の制御電圧を制御する位相比較器とを有してなる場合、発振器に入力される制御電圧を積分した物理量を判定用信号とすることができる。つまり、制御電圧を積分した物理量は2つの同期信号の位相差に応じた信号となり、画像信号に含まれる同期信号が検出できない場合は、実質的に位相差が大きく評価されて、制御電圧を積分した物理量は多きい値になる。

【0017】また、これに代えて、同期信号を検出してパルス信号を発生する場合は、そのパルスを判定用信号として用いることができる。この場合の判定基準は、パルスを一定時間計数して得られる計数値に対応して設定する。

【0018】また、判定基準を2つにし、1つのしきい値を有する第1の判定基準により判定した後、その判定に係る同一の判定結果の数を一定時間計数して1つのしきい値を有する第2の判定基準により同期信号の有無を判定するようにしてもよい。その場合でも、画像信号の入力が切り換えられたとき、第2の判定基準のしきい値を零乃至小さな値に一定時間変更することが好ましい。あるいは、第2の判定基準に不感帯を設け、画像信号の入力が切り換えられたとき、不感帯の幅を零乃至小さな幅に一定時間変更するようにすることができる。

【0019】上述した同期信号の有無判定に係る回路、あるいはこれを用いた同期検出システムは、ディスクリートの電子回路あるいはマイクロプロセッサを用いて容易に形成することができ、また電子回路とマイクロプロセッサを組み合わせても容易に形成することができる。

【0020】上記課題を解決する他の手段として、画像信号に含まれる同期信号を検出して得られる判定用信号に基づいて、同期信号の有無を不感帯を有する判定基準により判定し、画像信号の入力が切り換えられたとき、一定時間強制的に前記同期信号有りと判定するように前記判定用信号を生成するようにしてもよい。

【0021】

【発明の実施の形態】以下、本発明の実施の形態について図を参照して説明する。図1は、本発明の第1実施形態に係る画像同期信号の有無判定方法を適用してなる同期信号検出システムのブロック図である。図示のように、テレビジョン信号やビデオ信号等の画像信号（以下、テレビジョン信号の場合を例に説明する。）が入力される入力端子101と、フィルタ回路102と、同期

めた差分値Dとしきい値Qとを比較して、図2(a)に示すように、 $D \geq Q$ のときは同期信号無し、 $D < Q$ のときは同期信号有りの判定結果を出力する。一方、判定基準bは、今回のサンプリングで求めた差分値Dと2つのしきい値P、Q(但し、 $P > Q$)とを比較して、図2(b)に示すように、 $D \geq Q$ のときは同期信号無しの判定結果を出力し、 $D < P$ のときは同期信号有りの判定結果を出力し、 $P \leq D < Q$ の範囲にあるときは、前回のサンプリング時の判定結果に保持する。つまり、判定基準bはP-Q幅のいわゆる不感帯が設定されている。そして、同期信号有無判定器111は、通常時は、判定基準bにより判定するように設定されている。

【 0 0 2 4 】一方、制御手段 1 1 0 には、入力端子 1 0 9 からテレビジョン信号の入力が切り換えられたことを示す切換信号が入力される。つまり、この切換信号は入力端子 1 0 1 から入力されるテレビジョン信号が切り換わったことを示すものである。例えば、チャンネル切換信号、テレビジョン／ビデオの切換信号、電源のオン信号、等である。制御手段 1 1 0 は、その切換信号が入力されたとき、テレビジョン信号が切り換わったと判断し、同期信号有無判定器 1 1 1 の判定基準を変化させる指令を同期信号有無判定器 1 1 1 に出力する。つまり、その切換信号が入力されたとき、同期信号有無判定器 1 1 1 に対し、判定基準 b を判定基準 a に変更させる指令を出力し、一定時間経過後にその指令の出力を停止するようにになっている。

【0025】このような制御手段110の指令に応動して、同期信号の有無判定器111は判定基準をbからaに直ちに切り換え、サンプリングされる差分値Dについて判定基準aを用いて同期信号の有無の判定を行う。そして、一定時間後の切り換え指令の停止に応動して判定基準を元の判定基準bに戻すようになっている。

【0026】これにより、テレビジョン信号が切り換わった場合において、同期信号有無判定器111の判定結果の状態を、切り換わった時点におけるテレビジョン信号を不感帯のない判定基準aによる判定結果に更新することができ、その後、判定基準aによる判定結果を前回サンプリング時の判定結果として、判定基準bを用いて同期信号有無の判定を行うことになるから、差分値Dが不感帯の幅P-Qに入るD=Xのような弱電界のテレビジョン信号に切り換えられても、前回サンプリング時のD=Y（例えば、無信号）についての判定結果に影響されことなく、同期信号有りという正しい判定結果を得ることができるとともに、安定した判別結果を得ることができ、

〔 0 0 2 7 〕 なお、図 1 の同期信号検出システムにおいては、同期信号検出回路 1 1 3 の発振器 1 0 7 の制御電圧値を積分した物理量信号を判定用信号とし、これに基づいて同期信号有無の判定を行う例について示したが、これに限らず、同期信号の有無の状態を示す信号、例えば

ば一定時間内に検出される同期信号の数に応じた物理量信号を出力する構成の同期信号検出回路であれば本発明を適用できる。例えば、水平同期信号の周波数は規格によって 15.75 Hz に定められているから、その周波数のクロックで同期信号を検出してカウントし、そのカウント値を用いるようにしてもよい。この場合の判定基準は、一定時間内のカウント値が所定値以上か否かで判定することができ、また判定基準に不感帯を設けることも同様に可能である。その他、例えば、1 フレーム当たり走査線の数 525 本に定められている場合は、その走査線を数えて同期信号の有無を検出することができる。

〔0028〕図 3 に、本発明の第 2 実施形態に係る画像同期信号の有無判定方法を適用してなる同期信号検出システムのブロック図を示す。同図に示すように、本実施の形態に係るシステムは、テレビジョン信号の入力端子 101 と、同期信号検出回路 113 と、同期信号有無判定器 201 と、制御手段 202 と、同期有無判定結果の出力端子 112 と、同期信号出力端子 106 によって構成される。本実施形態は、同期信号有無判定器 201 の判定基準が判定基準 a に固定されて変更できない場合の例である。

〔0029〕次に、本実施の形態の詳細な構成について動作とともに説明する。図 3 において、図 1 の実施形態と均等なものには同一符号を付し、その説明を省略する。同期信号検出回路 113 から出力される同期信号有無の判定用信号は、同期信号有無判定器 201 に入力される。同期信号有無判定器 201 は、その判定基準を変更することができず、図 2 (a) に示した判定基準 a によってのみ同期信号有無の判定を行うようになっており、その判定結果は制御手段 202 に入力される。制御手段 202 は、同期信号有無判定器 201 から入力される判定結果を安定させるため、その入力される判定結果の信号に基づいて同期信号有無の判定を再度行うようになっている。また、制御手段 202 における同期信号有無の判定基準は、外部から与える指令によって変更できるようになっている。つまり、図 2 に示した 2 つの判定基準 a、b に相当する判定基準を備えている。そして、制御手段 201 から出力される判定結果は、出力端子 112 からテレビジョン受像機の各部に出力されるようになっている。

〔0030〕特に、制御手段 202 における同期信号有無の判定は、同期信号有無判定器 201 からの判定結果をサンプリングし、任意に定めた時間内における同一の判定結果の数（同期信号有り）又は同期信号無し（同期信号無し）の検出回数）を数え、その数と判定基準 a、b のしきい値と比較して判定する。この判定基準を外部からの切換信号によって、第 1 実施形態で述べたように制御することにより、それと同様の効果が得られる。

〔0031〕図 4 に、本発明の第 3 の実施形態に係る画

像同期信号の有無判定方法を適用してなる同期信号検出システムのブロック図を示す。同図に示すように、本実施形態のシステムは、テレビジョン信号の入力端子 101 と、信号切換回路 301 と、同期信号検出回路 302 と、同期信号有無判定器 303 と、制御手段 304 と、同期信号有無判定結果の出力端子 112 と、同期信号出力端子 106 によって構成されている。本実施形態は、同期信号有無判定器 302 の判定基準が、図 2 の判定基準 b に固定されており、変更できない場合の例である。

〔0032〕このように構成される図 4 の同期信号検出システムの詳細構成を動作とともに説明する。入力端子 101 から入力されたテレビジョン信号は、信号切換回路 301 に入力される。また、信号切換回路 301 には同期信号検出回路 302 から出力される同期信号が入力される。信号切換回路 301 は、同期信号検出回路 302 から出力される同期信号と入力端子 101 から入力されるテレビジョン信号のうちから、制御手段 304 によって選択された信号を同期信号検出回路 302 に出力する。同期信号検出回路 302 は、図 1 に示した同期信号検出回路 113 の機能に加え、外部の制御手段 304 から与えられる制御指令に応じて発振器の制御電圧を遮断できる機能を有しており、これによってフリーランの同期信号を出力することができるように構成されている。同期信号検出回路 302 から出力される同期信号は、同期信号有無判定器 303 に入力される。同期信号有無判定器 303 によって判定された判定結果は、出力端子 112 から出力される。同期信号有無判定器 303 は、その判定基準が外部から制御できず、判定基準 b によってのみ同期有無判定を行うものである。制御手段 304 は、入力端子 109 から入力される切換信号に基づいて信号切換回路 301 と同期信号検出回路 302 を制御する。

〔0033〕ここで、制御手段 304 の詳しい動作を説明する。通常時、制御手段 304 は、入力端子 101 から入力されるテレビジョン信号が同期信号検出回路 302 に入力されるよう制御する。そして、テレビジョン信号が切り換わったことを示す切換信号が制御手段 304 に入力されると、まず、同期信号検出回路 302 がフリーランの同期信号を出力するように制御する。さらに、このフリーランの同期信号が同期信号検出回路 302 に入力されるように、信号切換回路 301 を制御する。このとき、同期信号検出回路 302 には自己が出力している同期信号と同一の同期信号が入力されているので、同期信号検出回路 302 は同期信号有りに相当する判定用信号を出力する。この判定用信号は図 1 の判定器 103 の出力と同様である。したがって、同期信号有無判定器 303 は同期信号有りの判定結果を出力することになる。制御手段 302 は、任意に設定された時間の経過後、同期信号検出回路 302 にフリーランを停止させる指令を出力するとともに、入力端子 101 からのテレビ

ジョン信号を同期信号検出回路302に入力させるように信号切換回路301を制御する。この制御により、テレビジョン信号が切り換わる時点で、同期信号有無判定器303を強制的に同期有り状態にしていることから、従来技術の例で述べたように、無信号から弱電界のテレビジョン信号切り換わった場合においても、正しく同期信号有無の判定を行うことが可能である。

【0034】図5に、本発明に係る画像同期信号の有無判定方法をワイドテレビジョン受像機に適用した場合の第4実施形態に係るブロック図を示す。図示のように、ワイドテレビジョン受像機は、RF信号入力端子401と、チューナ402と、信号切換回路403と、Y/C分離回路404と、色復調回路405と、時間軸圧縮回路406と、RGB信号処理回路407と、偏向制御回路408と、CPT409と、ビデオ信号入力端子410と、リモコン等の外部からの制御信号入力端子411と、ワイドテレビジョン受像機全体を制御するシステム制御手段412と、画面表示制御回路413と、同期信号検出回路302と、同期信号有無判定回路111から構成される。なお、他の実施の形態と同一符号を付したブロックは、同一の機能構成を有するものである。

【0035】次に、図5に示したワイドテレビジョン受像機の動作を説明する。RF信号入力端子401から入力されたRF信号は、チューナ402によってテレビジョン信号に変換されて信号切換回路403に入力される。また、ビデオ信号入力端子410から入力されたテレビジョン信号(ビデオ信号)は、信号切換回路403に入力される。信号切換回路403は、システム制御手段412によって表示選択しているテレビジョン信号を、Y/C分離回路404と、同期信号検出回路302に10 入力する。Y/C分離回路404に10 入力されたテレビジョン信号は、色復調回路405、時間軸圧縮回路406、RGB信号処理回路407、偏向制御回路408を経てCPT409に10 入力され、映像として表示される。

【0036】一方、同期信号検出回路302は、入力されたテレビジョン信号から同期信号を検出し、それをRGB信号処理回路407に10 入力するとともに、同期信号有無の判定用信号(図1の積分器108の出力信号)を同期信号有無判定回路111に10 入力する。同期信号有無判定回路111は図1の実施形態と同様の判定基準a、bによりサンプリングした判定用信号に基づいて同期信号の有無を判定し、その判定結果をシステム制御手段412に10 入力する。システム制御手段412は、入力端子411から10 入力されるリモコン等の外部からの制御信号(切換信号)によって、チャンネル切換や入力切換を行う。この切換に合わせて同期信号検出回路302に10 入力されるテレビジョン信号が切り換わるので、同期信号有無判定回路111の判定基準を図1の実施形態と同様に10 制御する。

【0037】本実施形態は、図1の実施形態における制

御手段110の機能動作を、ワイドテレビ全体の制御を行うシステム制御手段412に組み込んだ場合の実施形態である。また、同期信号有無判定回路111として図3の第2実施形態の同期信号有無判定回路201を適用した場合においても、システム制御手段412によって、制御手段202の機能動作を行うことにより本発明を実施することができる。

【0038】図6に、本発明をワイドテレビジョン受像機に利用した場合の第5実施形態に係るブロック図を示す。本実施形態は、図5の実施形態に信号切換回路501を付け加え、同期信号有無判定回路111、システム制御手段412を、それぞれ同期信号有無判定回路303、システム制御手段502に置き換えたものである。同期信号有無判定回路303は、図4の第3実施形態で述べたように、外部から判定基準が制御ができず、判定基準bに固定して同期信号有無の判定を行うものである。このとき、システム制御手段502が、制御手段304と同様に、信号切換回路501と同期信号検出回路302を制御することによって、本発明を実施することができる。

【0039】

【発明の効果】以上説明したように、本発明によれば、同期信号有無の判定の妥当性及び安定性を向上させることができる。

【図面の簡単な説明】

【図1】本発明の第1実施形態の画像同期信号の有無判定方法を適用してなる同期信号検出システムのブロック図である。

【図2】本発明に係る画像同期信号の有無判定方法の判定基準を説明する図である。

【図3】本発明の第2実施形態の画像同期信号の有無判定方法を適用してなる同期信号検出システムのブロック図である。

【図4】本発明の第3実施形態の画像同期信号の有無判定方法を適用してなる同期信号検出システムのブロック図である。

【図5】本発明の第1実施形態の画像同期信号の有無判定方法を適用してなるワイドテレビジョン受像機のブロック図である。

【図6】本発明の第3実施形態の画像同期信号の有無判定方法を適用してなるワイドテレビジョン受像機のブロック図である。

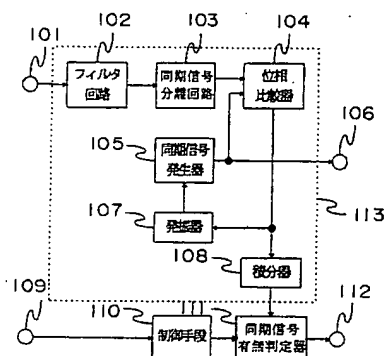
【符号の説明】

- 102 フィルタ回路
- 103 同期信号分離回路
- 104 位相比較器
- 105 同期信号発生器
- 107 発振器
- 108 積分器
- 110 制御手段

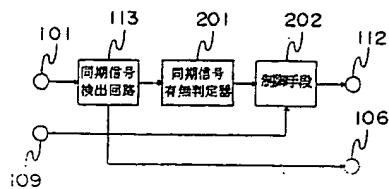
15

111 同期信号有無判定器
 113 同期信号検出回路
 201 同期信号有無判定器
 202 制御手段
 301 信号切換回路
 302 同期信号検出回路
 303 同期信号有無判定器
 304 制御手段
 401 R F 信号入力端子
 402 チューナ
 403 信号切換回路
 404 Y/C 分離回路

【図1】



【図3】



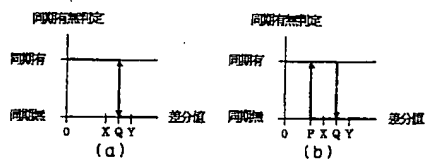
(9) 特開平10-210375

16

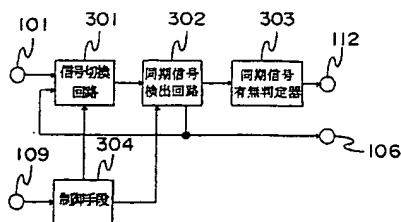
* 405 色復調回路
 406 時間軸圧縮回路
 407 R G B 信号処理回路
 408 偏向制御回路
 409 C R T
 410 ビデオ入力端子
 411 制御信号入力端子
 412 システム制御手段
 413 画面表示制御回路
 10 501 信号切換回路
 502 システム制御手段

*

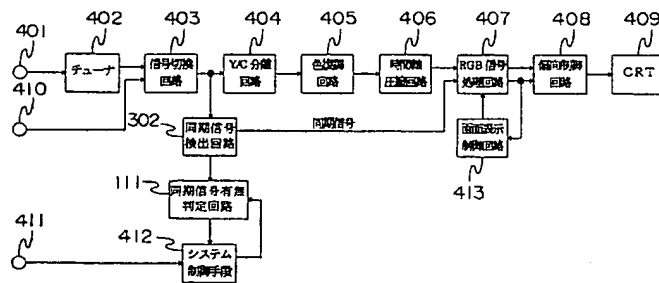
【図2】



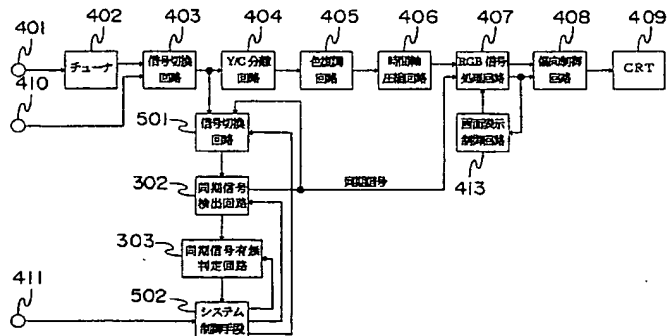
【図4】



〔図5〕



〔図6〕



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